SECTION 15185
CHEMICAL WATER TREATMENT

****

LANL MASTER CONSTRUCTION SPECIFICATION

This specification specifies Garratt-Callahan, Lakos, and Thermo Polysonics products for chemical treatment of closed HVAC, open cooling tower, and steam boiler systems. Consult with the FM Facility Engineer for the type of treatment system/chemicals required. ***Italicized*** text identifies recommended guidance (not mandatory). All other text in regular type indicates mandatory requirements.

All chemicals must be identified in LANL's NPDES permit application and LANL's waste profile form (WPF) as potential contaminants of concern. Consult with RRES-WQH, Water Quality and Hydrology Group.

When editing to suit project, author shall add job-specific requirements and delete only those portions that in no way apply to the activity (e.g., a component that does not apply). To seek a variance from applicable requirements, contact the LEM Mechanical POC.

When assembling a specification package, include applicable specifications from all Divisions, especially Division 1, General Requirements.

Delete information within "stars" during editing.

Specification developed for ML-3 projects. For ML-1 / ML-2, additional requirements and QA reviews are required.

****

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Cleaning of HVAC piping systems.

B. Chemical water treatment of [closed HVAC], [open cooling tower], and [steam boiler] system(s).

1.2 CONTRACTOR REQUIREMENTS

A. Notify LANL Construction Inspector at least 24 hours (1 working day) in advance to witness cleaning (flushing) and water treatment activity.

B. Do not fill or flush piping systems until source of water supply is approved by LANL Construction Inspector.

C. Do not clean or chemically treat piping systems until systems have been successfully pressure tested.

D. For discharge requirements of water used for flushing and water treatment, comply with Section 01325, Water Discharge Requirements.

E. Notify LANL Construction Inspector immediately in the event of any accidental discharge.

F. Do not place piping systems in service until LANL Construction Inspector approves cleaning and chemical treatment results.

1.3 LANL CONSTRUCTION INSPECTOR REQUIREMENTS

A. For discharge requirements of water used for flushing and water treatment, comply with Section 01325, Water Discharge Requirements.

B. Verify proper cleaning, flushing, chemical concentration and circulation.

C. Immediately after receiving list of chemicals to be used from contractor, including chemical composition, submit copy to RRES-WQH for approval.

1.4 SUBMITTALS

A. Submit the following in accordance with Section 01330, Submittal Procedures:

1. Catalog data of flushing and chemical water treatment chemicals and equipment including electrical characteristics and connection requirements.

2. Operation and Maintenance data on equipment, procedures, and treatment program. Include instructions on test procedures including target concentrations.

3. Submit material list of all chemicals to be used, including chemical composition, to LANL Construction Inspector 30 days prior to using chemicals. Do not begin chemical treatment until chemicals have been approved by LANL (RRES-WQH).

1.5 QUALIFICATIONS OF CHEMICAL SUPPLIER

A. Company specializing in performing the Work of this section with minimum 10 years experience and approved by chemical manufacturer.

B. Personnel using biocide products shall have a New Mexico Department of Agriculture (NMDA) pesticide applicator license.

1.6 QUALITY ASSURANCE

A. Biocide products shall be registered with the EPA, with the registration number clearly shown on drum labels.

PART 2 PRODUCTS

2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

A. Comply with Section 01630, Product Options and Substitutions.

B. A single water treatment supplier shall provide treatment chemicals and chemical feed/chemical control equipment.

2.2 MATERIAL SAFETY DATA SHEETS

A. Maintain on site Material Safety Data Sheets (MSDS) for chemical products.

2.3 SYSTEM CLEANING

A. Manufacturer: *Garratt-Callahan, Formula 248L*.

B. Treatment Chemical: *Alkaline liquid blend of phosphates, silicates, iron oxide chelants, dispersants, and surface active agents*.

2.4 CLOSED LOOP WATER TREATMENT (HEATING WATER AND CHILLED WATER)

1. Manufacturer: *Garratt-Callahan*.

2. Chemical Pot Feeder: *Model FTF-5, 71/2 gallon capacity, steel construction, rated at 300 psi and 200 degree F, with option of adding a filter bag*

.

3. Treatment Chemical: *Formula 1015L, corrosion and scale inhibitor based on phosphorate and orthophosphate.* Furnish 1 year's supply.

2.5 OPEN COOLING TOWER WATER TREATMENT

****
Refer to Mechanical Drawings ST6800 (Guidance), Open Cooling Tower Water Treatment Flow Diagram.
****

A. *Manufacturer: Garratt-Callahan.*

B. *Control Panel: Model 25-161-FS-CR30-330-SPLMB. Prewired and preplumbed on a stainless steel wall mounting plate with a Plexiglas safety shield, size 42L x 32H x 12D (inches), furnished with a 15 amp, 120VAC duplex receptacle for incoming power. Components include*:

1. *Two chemical pumps, Model Lb-64-KTC.*

2. *Conductivity controller, Model 161FS, conductivity range 0-5000 S.*

3. *ORP controller, Model 330, ORO range 0-1000mV*.

C. *Brominator: Model SC-10-S-05, Factory assembled with flow meter, drain valves, inlet and outlet valves, and base*.

D. *Chemical Tanks (treatment chemicals 1265 and 2011): Model G-40-F, 40 gallon polyethylene tank,* double contained with cover.

E. *Chemical Tank with pump (treatment chemical 159)*:

1. *Tank, Model G-40-4, 40 gallon polyethylene tank,* double contained with cover.

2. *Chemical pump, Model Lb-64-KTC*.

F. *Solenoid Valves (brominator and dechlorination lines): Model 8210G95, 2-way normally closed, zero pressure, 3/4 inch pipe size, and 120VAC*.

G. *Corrosion Coupon Rack: Model 9050, 3/4 inch schedule 80 PVC*.

H. Treatment Chemicals: (Furnish 1 Year's Supply)

1. *Formula 159 oxygen scavenger. Crystallized liquid formation of potassium/sodium/bisulfate*.

2. *Formula 314T biocide. Solid tablets that dissolve in water to release chlorine and bromine*.

3. *Formula 2011 cooling water treatment. Corrosion inhibitor to protect steel and copper metal from oxygen corrosion*.

4. *Formula 1265 Polymeric Dispersant: Aqueous blend of proprietary polymer for silica control*.

2.6 *SEPARATOR (OPEN COOLING TOWER)*

A. *Manufacturer: Lakos, No. TC-[ ]-CRS or AXL-[ ].*

B. *Steel construction, rated at 150 psig, flanged connections. Flow range [ ] gpm*.

2.7 FLOW METER (OPEN COOLING TOWER)

A. Manufacturer: Thermo Polysonics, Model SX40

B. Doppler ultrasonic flow meter, dedicated, noninvasive, digital display of rate (gpm) and total flow (gallons), 4-20 mA output signal, 120VAC, single phase, 20-foot standard cable length, accuracy within plus or minus 2 percent of full scale, NEMA 4X thermoplastic housing, for use on [ ] SCH 40 pipe, standard flow range 1-10 fps.

2.8 STEAM BOILER WATER TREATMENT

****
Consult with the FM Facility Engineer and chemical supplier for type of chemical feed and control equipment required for the steam boiler water treatment system.
****

1. Manufacturer: *Garratt-Callahan, Formula 1152.*

2. Treatment Chemical: *Formula 1152 boiler water treatment, liquid all-polymeric scale corrosion inhibitor.* Furnish 1 year's supply.

PART 3 EXECUTION

3.1 INSTALLATION

A. Contractor shall furnish and install water treatment system supplied by the water treatment supplier.

3.2 PRE OPERATION CLEANING (OPEN COOLING TOWER AND CLOSED LOOP SYSTEM)

A. Prior to startup, clean system with *Formula 248L*, following the written procedures furnished by the chemical supplier.

1. Ensure water filters, instrumentation, gages, flow transmitters, and similar items are removed or protected. Provide a temporary bypass or plugs as required.

3.3 CHEMICAL SUPPLIER WATER TREATMENT SERVICE PROGRAM

A. Provide consulting services for a period of 1 year from the time of startup which shall include:

1. Installation and startup recommendations.

2. Field water analysis and recommendations.

3. Quarterly lab analysis on treated systems for metals, microorganisms, and standard analysis.

4. Training of plant personnel in proper feed and control.

5. Minimum monthly service calls.

6. Log sheets and record forms.

END OF SECTION